perial one is, however, highly laudable, and should be encouraged with a view to the unification of British medical science. It is further announced that a long-deferred step is about to be taken by the introduction of the metric system into the body of the work. In the present edition the centimetres and grammes of science appear modestly in the supplementary pages dealing with volumetric processes, and then only as an alternative to grains and "grain-measures." We understand that in the new revision centimetres and grammes will be made official in all the monographs of the text, side by side with the still legalised grains and ounces, minims and drachms. This change will bring the British handbook into line with the official dispensatories of all other civilised States, and should tend to hasten the time when the international system of metric weights and measures shall acquire full legal authority in this country.

It thus appears that the Medical Council's Committee have undertaken the task of revision with an adequate sense of their responsibility. They have in the suggestions of the medical authorities at home and abroad, and in the useful digests of the literature of pharmacy, prepared from year to year by their reporter, Prof. Attfield, ample materials whereon to base their deliberations. As a body of physicians representing the supreme council of the profession, they are eminently qualified to judge as to the requirements of practical medicine and clinical therapeutics. Where their domain borders on that of the specialist in chemistry, botany, pharmacy, or physiological pharmacology, they propose to have recourse to the most skilled representatives of these branches of science. The result of their labours, thus conceived and carried out, will be awaited with interest not only by practitioners of medicine and pharmacy, and by manufacturing chemists, but by all who have sympathy with the application of science to human needs.

THE FIRST MERIDIAN.

At the recent Geographical Congress in London, the question of the first meridian was discussed with particular interest.

It was proposed that the first meridian should not be established officially, but should merely be settled with a view to producing an international map to the scale of millionths. M. A. de Lapparent has written an article in *La Nature* on the subject, of which the following is an analysis; it is a noteworthy occurrence that a Frenchman should have taken up the subject with such interest, for the French has hitherto been the only nation to reject the Greenwich meridian. In the preliminary discussions they have brought upon themselves many reproaches for hindering a scientific work the use of which every one had recognised, while they themselves had no principle to bring forward to support their objections. The matter has been much discussed amongst them, and at the Geographical Society of Paris, by a special commission, it was decided that the map should be accepted. It was considered best that France should not be the only country to refuse the project; nevertheless, it was decided to insist on the metric system being used, for here a principle was involved.

On this subject M. de Lapparent writes as follows:—

"Thus, true to its habit of fighting for its views, France has again showed itself champion of the metric system, offering to make, for the scientific and rational interest, a sacrifice of national self-love. It would be impossible for it to capitulate on the question of the system, for here a principle is concerned; but the choice of a meridian, depending on no logical consideration, could be more easily granted. Evidently the proposed map, if ever produced was to be arranged so as to be a help to already existing aps, the latter being in great majority on the meridian of Greenwich; by wishing to impose the meridian of Paris (which would not have been a success), it would have caused greater trouble than the contrary case. Henry IV. estimated that Paris was worth a mass; the French delegates, however, said on their side that the concession of a meridian, for a special and determined work, was quite worth the agreement which was expected to be established in view of the adoption, for the same purpose, of the metric system."

Many of our own countrymen have regretted that the public spirit prevented the system being used officially in Britain.

However, the acceptance of the Greenwich meridian well deserved a recompense, and the vote was unanimously carried that the metric system should be used for the map.

It is worth observing that the subject was discussed with remarkably few disagreements, considering that the congress was international. This seems to show that the time is fast approaching when national prejudices will be done away with if they support illogical theories; if principles are involved, it is right they should be adhered to, but they should not be allowed to hinder an enterprise profitable, perhaps, to all humanity.

NOTES.

The *Times* of yesterday published a telegram, dated September 17, from Sandefiord, Norway, received through Reuter's Agency, stating that advices received at Sandefiord from the Danish trading station of Angmagsalik, on the east coast of Greenland, state that towards the end of July a three-masted ship, with a short foremast, was seen by Eskimos on two occasions firmly embedded in drift ice. On the first occasion the ship was observed off Sermiligak, 65° 45′ lat. N., 36° 15′ long. W.; and the second time off Sermelik. 65° 20′ lat. N., 38° long. W. It is believed tha the vessel was Dr. Nansen's *Fram*, and that she was on her return journey. In any case, however, no positive news of the exploring vessel is expected to arrive until next year.

On Wednesday, Sept. 11, a Reuter telegram announced that the steam yacht *Windward*, which took out the Jackson-Harmsworth Polar Expedition, had arrived at Vardö, and on Thursday another telegram, through the same Company's agency, stated that the expedition, after leaving Archangel, passed the winter on Franz Joseph Land, from which place a start was made in the middle of July. The crew appear to have suffered severely from scurvy, and all the members of it are more or less weakened by the malady. Three of the men succumbed, and two others were removed to the hospital at Vardö.

The *Standard* states that the excavations that are being carried out by the Greek Archæological Society on the site of ancient Eleusis, a few miles from Athens, have just yielded some results of exceptional importance. In a very ancient and well-preserved tomb, there have been found, in addition to the skeleton of a woman, a number of articles, including earrings of fine gold, silver, and bronze, several finger rings, sixty-eight small vases of various shapes in terra-cotta, two tripods, three Egyptian scarabæi, and a small statuette of the goddess Isis in porcelain. These discoveries leave no doubt of the fact that the celebrated mysteries of Eleusis were of Egyptian origin, and were borrowed from the religious rites of the ancient Egyptians. These important relics have been deposited in the National Museum.

A Reuter's telegram of September 11, from Berne, reported the fall of a huge mass of ice from the Altels Glacier upon the hamlet of Spitalmatte, in the Upper Gemmi Pass, causing the death of at least ten persons, and the loss of, it is estimated, two hundred head of cattle. A stretch of land nearly two miles in length has been overwhelmed, and the pass has been partially blocked.

THE death is recorded of Dr. L. Galassi, Professor of Medical Pathology in the University of Rome; Dr. Friedrich Miescher, sometime Professor of Physiological Chemistry, and Dr. von Sury, Professor of Forensic Medicine in the University of Basel.

DR. RUFFER is, we are sorry to learn, suffering from an attack of diphtheritic paralysis, and will not, in consequence, be able to deliver his intended course of lectures at the British Institute of Preventive Medicine, or, indeed, do any work for some time to come.

THE following lectures will be delivered at the Royal College of Physicians during the coming year:—The Goulstonian Course by Dr. Patrick Manson; the Lumleian Lectures by Sir Dyce Duckworth; the Croonian Lectures by Dr. George Oliver; and the Bradshaw Lecture by Dr. Bradbury. The Croonian lecturer for 1897 is Dr. Greenfield.

THE Berlin Academy of Sciences will award the Steiner prizes, of the respective value of 4000 and 2000 marks, for papers in continuation of J. Steiner's work on curved surfaces. The essays must be submitted to the Academy before the end of 1899.

AMONG a number of plumassier's bird-skins, said to have been brought from the foot of the Charles Louis mountains in New Guinea, has been found the skin of a most remarkable new Bird of Paradise of the genus *Astrapia*, conspicuous for its crimson gorget and black-and-white tail. This specimen, which has been secured for the Tring Museum, has just been described by Mr. Walter Rothschild as *Astrapia splendidissima*.

A NEW part of the quarto *Transactions* of the Zoological Society, which will be issued on October 1, will contain an important memoir on the Dinornithidæ, by Prof. T. Jeffery Parker. The author enters at length upon the osteology, classification and phylogeny of these extinct birds, giving special attention to their cranial characters. Prof. Parker is inclined to associate the Moas with the Kiwis (Apterygidæ), rather than with any other existing family of the class of birds.

WITH the new number that has just been issued, the publication of that valuable American periodical *Insect Life* comes to an end. The cessation takes place, we are told, for administrative reasons. Happily, the good work which it accomplished will be continued in two series of bulletins from the Division of Entomology of the U.S. Department of Agriculture. A new series of general bulletins will be begun, and will contain short reports on special observations, and the miscellaneous practical and economic results of the work of the division, and in directions of general interest. This first series will be sent to all the present readers of *Insect Life* who desire them. The second series of bulletins, published at rarer intervals, will publish the results of the purely scientific work of the members of the office force, and will consist largely of longer or shorter monographic papers on groups of North American insects. This series will be distributed only to libraries and to working entomologists. The publication of the divisional series of circulars of information upon especially injurious insects, of farmers' bulletins upon special entomological topics (principally methods of treatment), and of occasional special reports will be continued.

THE Third Report of the Royal Commission appointed to inquire what light-houses and light-vessels it is desirable to connect with the telegraphic system of the United Kingdom by electrical communication, stated that the value of the warning conveyed to passing vessels by the display of storm signals, on the occasion of the approach of heavy gales, could scarcely be overestimated, and recommended that the light-houses on the most prominent points of the coast of the United Kingdom, with which electrical communication exists, should be made storm-warning stations. In compliance with this recommendation the Meteorological Council have now made arrangements for the supply of storm-warning telegrams to twenty-five prominent headlands on the coast, for the benefit of passing vessels, in addition to the telegrams at present forwarded to ports and harbours, which are intended more particularly for the use of vessels leaving the places at which the signals are hoisted. The signals used are canvas cones, with point upwards or downwards, to signify whether northerly or easterly, or southerly or westerly gales are expected, and are practically the same as those originally adopted in 1860 by Admiral FitzRoy, then chief of the Meteorological Department of the Board of Trade. The light-house authorities have readily assisted in carrying out the recommendation of the Royal Commission, by allowing their light-keepers to undertake the management of the signals.

WE have received a volume of meteorological observations made at Rousdon Observatory during the year 1894, under the superintendence of Mr. Cuthbert E. Peek. This observatory is situated a short distance within the eastern boundary of Devonshire, in close proximity to the cliff, at an elevation of 516 feet above mean sea-level, and forms an important station of the Royal Meteorological Society. In addition to very complete meteorological observations, experiments of various kinds are carried on, in connection with evaporation, agriculture, &c. Mr. Peek remarks that, from an agricultural point of view, the year 1894 may be briefly summarised as a year of plenty, but with prices too low to pay for the cost of production. Since 1883, a daily comparison of the weather experienced at this observatory with that predicted for the district in the forecasts issued by the Meteorological Office has been made. The published daily weather reports were received the day following the date of issue, and the forecasts contained in them were therefore not seen until after the actual weather experienced had been recorded. The results have proved of much interest; for the year 1894, ninety-three per cent of the forecasts for wind and for weather, separately compared, were found to be trustworthy. A table of comparisons for the years 1884–94 shows that the percentage of successful forecasts has improved year by year.

THE preparation of artificial human milk has from time to time occupied the attention of investigators, but so far, according to Dr. Backhaus, no satisfactory substitute has been produced in the place of human milk. Dr. Backhaus has, however, quite recently endeavoured to supply this deficiency, and stimulated by Kehrer's method he has succeeded in producing so-called artificial human milk. The milk is carefully collected with the usual hygienic precautions of cleanliness, &c., and then submitted to fermentation by means of rennet, in the course of which a relatively rich milk serum is procured containing albumen and milk sugar. This serum is carefully sterilised, and by the addition of cream a material is produced which closely resembles human milk, which may be varied in composition according to the age or particular requirements of the individual. Since, however, our knowledge of the properties possessed by the natural fluids of the body has been recently extended in so remarkable a manner, the subject of artificial milks has become invested with new considerations, which a few years ago were not even suspected. In the course of his paper Dr. Backhaus points out that the sterilisation of milk should, if possible, be carried out on the large scale in dairies before distribution, that in this way better apparatus being to hand, more cleanly besides more effectual results will be obtained than when it is left in the hands of private individuals. As demonstrating the importance of freeing the milk from impurities before use, Dr. Backhaus mentions that the city of Berlin alone consumes daily with its milk 300 cwt. of cow dung!

Although the extension of geological research into distant parts of the earth has shown that the divisions of time originally made in Europe are not always applicable to other areas, yet it is possible that the greatest geological division-lines that are recognised may represent world-wide periods of rapid change. Such is the view expressed by Prof. Le Conte in a paper on "Critical Periods in the History of the Earth," published by the University of California. He considers that in the evolution of the earth there must have been now and again, amid many smaller local changes, readjustments of the crust affecting the whole earth, with something approaching simultaneity. Such universal changes must be used to mark out the primary divisions of time: they are marked by widespread unconformities and the birth of great mountain-ranges, and as consequences of these changes in physical geology there follow remingling of faunas, the extinction of many types, the more rapid evolution of new forms, and the origin of new dominant classes. We thus have an alternation of short "critical" periods of extensive change and long periods of gradual change, the former marking the commencement of the great time-divisions of the earth's history. Four such critical periods can, in Prof. Le Conte's opinion, be recognised—the pre-Cambrian, the post-Palæozoic, the post-Cretaceous, and the Glacial. Comparing these with one another, he finds progressive change in their character; each one is shorter in duration than the previous one, and involves greater climatic changes and increased faunal effects from the introduction of new dominant types.

Dr. Gerhard Schott has published some interesting maps concerning the present conditions of sail navigation, which are appended to his paper on the subject appearing in the *Zeitschrift der Gesellschaft für Erdkunde*. They are chiefly compiled from log-books examined at the Deutsche Seewarte, Hamburg. The two main lines of voyages for German sailors are the "saltpetre trips" to the west coast of South America, and the "rice trips" to India and the Straits Settlements. A map divided into zones of equal travelling times from the Lizard shows the remarkable fact that the mouth of the Congo is one of the most difficult parts to reach in a sailing vessel. The Cape and Patagonia can be reached in the same time. The southern Indian Ocean forms a kind of racecourse along which the vessels speed to Australia in the same time as it would take to reach Zanzibar. Adelaide can be reached in ninety days, and so can Chile. New York, which requires forty days, is in that respect as distant as Panama, and is one of the most inaccessible ports for a sailing vessel, especially in the winter. The return is easier, and can be accomplished in twenty-five days, whereas the return from Panama takes sixty. The return from Australia is equally lengthy round the Cape as by Cape Horn, and the latter route is now preferred owing to the notoriously dangerous character of Cape Agulhas. Needless to say, the Suez Canal is quite useless for sailing vessels. Even apart from the fact that the Red Sea is most difficult to navigate, the canal dues exclude vessels whose vitality lies solely in the cheap freights they can offer in competition with steamers. With the modern construction of sailing vessels, which are built almost exclusively of iron and steel, the only enemies seriously feared are fogs, icebergs, and dead calms, to which we must add, in the much-frequented ocean highways of the northern Atlantic, the fast mail steamer. The average skipper does not mind a storm, but rather welcomes it, as it makes him go all the faster.

The *Journal of the Franklin Institute* states that the recent trials of electric locomotives at Nantasket Beach, near Boston, and at Baltimore, have so satisfactorily demonstrated the superiority of this class of motor over the steam locomotive for short hauls, that it is now very generally admitted that the near future will witness a very extensive application of the new form of motive power for short branch lines, tunnel haulage, &c. At the Nantasket Beach trials, it is stated that a speed exceeding sixty miles an hour was attained, and at Baltimore the test of the electric locomotive designed to draw trains through the tunnel, 7430 feet long, in that city, was highly successful. A maximum speed of fifty miles an hour is to be developed, and it is guaranteed that the locomotive will pull 1200 tons at a speed of thirty miles an hour. The system has been in practical and regular operation on the Nantasket Beach Railway since the end of June last.

According to the *Engineer*, a French physicist, M. Denayrouze claims to have discovered a means of increasing the illuminating power of gas about fifteen times. In his lamp M. Denayrouze employs a spherical-shaped metallic body, and a mantle capable of being raised to incandescence. In the body of the lamp is fixed a tiny motor, which works a ventilator, and which receives current from a couple of small accumulators. The electrical energy required is said to be only $\frac{1}{3}$ volt and $\frac{1}{10}$ of an ampere, and to be sufficient to force a current of air through the mantle and to cause the gas to burn with remarkable brilliancy. The burner is said to consume seven litres of gas per carcel, and lamps have been made having an illuminating power of 800-candle power.

Speaking of some experiments in marching, which have recently been carried out at the request of the German War Office, by some students of medicine of the Friedrich Wilhelm Institute in Berlin, who for the purpose wore the regulation uniforms and carried the full field service equipments, the *British Medical Journal* says:—"The marches performed varied from 22 to 33 miles, and were executed in all kinds of weather. The weights or loads carried varied from 48 to 68 lbs., the full service equipment of the German infantry soldier averaging 70 lbs. That of our own infantry does not usually exceed 60 lbs. The conclusions arrived at by the medical officers in charge of the experimental observations were practically as follows: When the load is not excessive and does not exceed 48 lbs. a march of twenty-five miles executed in cool weather (60° F.) is readily performed, and has no deleterious effects upon the man, even if continued for some days consecutively. With a mean temperature of 70° F. a similar load carried the same distance has a considerable temporary effect upon the organism, necessitating a rest of at least ten hours in the twenty-four. A load of 68 lbs. could not be carried twenty-five miles without inducing grave physiological disturbance, necessitating a full day's rest on the following day. This weight was not readily carried day by day without derangement of health over greater distance than fifteen miles. A weight of 60 lbs. was the maximum weight which could be carried on consecutive days for twenty-five miles by a man weighing 11 stone during ordinary summer weather consistently with health. It is not stated whether the men by whom these experiments were made were picked individuals, or what was their dietary."

The current number of *The Leisure Hour* contains an interesting article by E. Whymper, on some high mountain observatories, accompanied by illustrations and short accounts of the difficulties experienced and the results attained. The observatories described are:—Mount Washington, in New Hampshire, U.S.A., 6286 feet high; it was established in 1870, but is now closed. Pike's Peak, in Colorado, 14,134 feet high, was erected in 1873, and closed in 1888. This station was celebrated for its electrical storms. The most elevated station is on the top of the Misti, near Arequipa, in Peru. This is 19,200 feet above the sea, but notwithstanding its great elevation, the ascent is comparatively easy. About twelve miles to the north there is a mountain called Charchani, about 20,000 feet high; an observatory was established just below the snow-line, at the height of 16,650 feet, in the years 1892–3, but is now abandoned. The article contains a graphic account of the difficulties of establishing two observatories on Mont Blanc, one at 14,320 feet, and the other on the summit, at 15,780 feet, by M. Vallot and M. Janssen, respectively. The meteorograph for the summit of Mont Blanc has been constructed by M. Richard at a cost of £750, and the clockwork is calculated to remain in action for eight months.

USEFUL and practical publications continue to issue from the various botanical experiment stations in the United States. We have on our table the following:—From Kansas State Agricultural College, *Bulletin* No. 50, comprising a list of Kansas weeds, with descriptions, and figures of the seedling forms; from Cornell University, an essay, by Mr. G. F. Atkinson, on "Damping Off," containing a description, with figures, of the various parasitic fungi which accompany this phenomenon, including a new species, *Volutella leucotricha*; and "Studies in Artificial Cultures of Entomogenous Fungi," by Mr. R. H. Pettit, also illustrated by plates.

THE Report of the Botanical Exchange Club of the British Isles for the current year is issued, with a list of Desiderata. The main portion of the very useful work done by this Association rests with two or three individuals. This work would be greatly promoted by the addition of a few new subscribers, who should address themselves to Mr. Charles Bailey, College Road, Whalley Range, Manchester.

THE following colonial botanical publications have reached us:—The *Bulletin* of miscellaneous information of the Royal Botanic Gardens, Trinidad, for July, containing a number of notes on native and cultivated plants in the colony, by Mr. J. H. Hart; *Botany Bulletin*, No. 10, of the Department of Agriculture, Brisbane, consisting of contributions to the Queensland flora, by Mr. F. M. Bailey; *Proceedings* of the Royal Society of Queensland, vol. xi. pt. 1, with the annual address of the President, Mr. R. L. Jack, on "The Higher Utilitarianism."

MESSRS. G. PHILIP AND SON have reprinted for Dr. Mill the paper on "The English Lakes," which, under the title of "On the Bathymetrical Survey of the English Lakes," the author contributed to the July and August numbers of the *Geographical Journal*. The book is nicely got up, and is illustrated by numerous photographic views, maps, and diagrams.

A NEW edition—the third—of Clowes and Coleman's "Quantitative Chemical Analysis" has been sent to us by Messrs. J. and A. Churchill. The work has undergone certain changes since the publication of the second edition, the matter having been increased, the text revised, and some new figures added.

THE September part of *Science Progress* contains the following articles:—"Progress in the Study of the Ancient Sediments," by J. E. Marr; "On the Respiratory Function of Stomata," by F. Frost Blackman; "The Zoological Position of the Trilobites," by H. M. Bernard; "Some Metasomatic Changes in Limestones," by A. Harker; and "The Decomposition Products of Proteids," by Dr. T. Gregor Brodie.

THE series of small books, entitled "Encyclopédie Scientifique des Aide Mémoire," which is being brought out conjointly by Messrs. Gauthier-Villars and G. Masson, of Paris, has had another addition made to it by the publication of "Cubature des Terrasses et Mouvement des Terres," by G. Dariès.

THE paper "On the Cost of Warships," which was read by Dr. F. Elgar at this year's summer meeting of the Institution of Naval Architects, has been issued in pamphlet form by the Institution. The pamphlet also contains a report of the discussion on the paper which took place at the meeting.

WE have received the *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, fourth series, vol. ix., No. 3, 4, and 5, and the *Journal of the Asiatic Society of Bengal*, vol. lxiv., part 2, No. 2.

MR. R. W. PAUL, of Hatton Garden, has sent to us advance sheets of his new catalogue of electrical testing and measuring instruments. Many of the instruments are figured.

THE University Correspondence College has issued its Intermediate Arts Guide, No. x., with the papers set at London University, July 1895, and articles on the special subjects for 1896, and its London Inter. Science and Prel. Sci. Guide No. vii., with the papers set at London University, July 1895.

THE August numbers of the *Journal of the Royal Microscopical Society* and of *Clinical Sketches* have reached us; also part vi. of the *Katalog der Bibliothek der Kaiserlichen Leopoldinisch-Carolinischen Deutschen Akademie der Naturforscher*, Halle; and Messrs. Friedländer and Söhn, Berlin, have sent us No. x. to xiv. of *Naturæ Novitates*.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*, ♂) from India, presented by Miss E. S. Cooper; a Smith's Dwarf Lemur (*Microcebus smithi*) from Madagascar, presented by Miss Ruby Woolcott; a Yellow-fronted Amazon (*Chrysotis ochrocephala*) from Guiana, presented by Mr. W. Page; a Beautiful Grass Finch (*Pœphila mirabilis*, ♂) from Australia, presented by Mr. Gerard O'Shea; a Brazilian Tortoise (*Testudo tabulata*) from Brazil, deposited; three Boas (*Boa constrictor*) from Brazil, purchased; a Wapiti Deer (*Cervus canadensis*, ♂), two Triangular-spotted Pigeons (*Columba guinea*), a Spotted Pigeon (*Columba maculosa*), two Crested Pigeons (*Ocyphaps lophotes*), two Half-collared Doves (*Turtur semitorquatus*), two Vinaceous Doves (*Turtur vinaceus*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE SPECTRUM OF MARS.—In connection with the recent discussion as to the presence or absence of the bands of water vapour in the spectrum of Mars, Dr. Janssen has published further particulars of the observations made by him in 1867 (*Comptes rendus*, July 29). He points out that even with the quantity of vapour in our own atmosphere, the bands would be all but invisible to an observer on Mars if the solar light were reflected normally from the earth's surface, and since the general conditions of the planet point to its atmosphere being less important than our own, it is easy to understand that the detection of the bands is a very delicate observation. To reduce the absorptive effect of the terrestrial atmosphere, observations should be made at a high altitude, and the use of the lunar spectrum as a term of comparison is also important. As to the apparatus required, Dr. Janssen does not consider large telescopes indispensable, as even with them the telluric bands can only be observed in their totality. Previous to observing the spectrum of Mars, Dr. Janssen had been engaged in an extensive study of the spectrum of water vapour as exhibited by a tube 37 metres in length. The observations of Mars were made on May 12–15, 1867, from a station on Mount Etna at an altitude of nearly 3000 metres; at meridian passage the altitude of the planet was 72°, and at sunset, when the observations were commenced, it was still more than 60° above the horizon, while the moon was a little lower. The cold was excessive during the nights of observation, and the quantity of vapour contained in the atmosphere overlying the place of observation would not be able to give indications of the telluric groups near C and D, according to the experiments with the long tube. Under these highly favourable conditions, Dr. Janssen found feeble but certain indications of the groups at C and D, and he is confident that future researches will justify the conclusion at which he arrived.